

CLAIMS

1. A computer system comprising:

- a central processing unit provided, in
5 addition to a normal mode, with a plurality of
power saving modes characterized by respective
power consumption levels, and sequentially
executing a plurality of jobs generating associated
time-out interruption requests;
- 10 storage means storing a return time table
mapping the plurality of power saving modes of said
central processing unit into respective return time
required for said central processing unit to return
from the corresponding power saving mode to the
15 normal mode;
- list updating means updating a time-out list,
chronologically listing the time-out interruption
requests, based on the time-out interruption
requests from the plurality of jobs executed by
20 said central processing unit;
- timer means outputting time-out interruptions
to said central processing unit when the time-out
time listed in the time-out list elapses;
- setting means setting a next time-out time in
25 said timer means whenever a time-out interruption
occurs in accordance with the order listed in the
time-out list;
- transition mode selection means referring to
the return time table when said central processing
30 unit is put in an idle state, and selecting, as a

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transition mode, a power saving mode having the longest return time, from a group of one or a plurality of power saving modes having a return time shorter than the time-out time designated for
5 the subsequent time-out interruption; and

operation mode control means controlling said central processing unit to operate in the transition mode since the start of the idle state until an input of the subsequent time-out
10 interruption, and returning said central processing unit to the normal mode when the time-out interruption is generated.

2. A computer system comprising:

15 a central processing unit provided, in addition to a normal mode, with a plurality of power saving modes characterized by respective power consumption levels, and sequentially executing a plurality of jobs generating associated time-out interruption
20 requests;

storage means storing a return time table mapping the plurality of power saving modes of said central processing unit into respective return time required for said central processing unit to return
25 from the corresponding power saving mode to the normal mode;

list updating means updating a time-out list, chronologically listing the time-out interruption requests, based on the time-out interruption
30 requests from the plurality of jobs executed by

said central processing unit;

timer means outputting time-out interruptions to said central processing unit when the time-out time listed in the time-out list elapses;

5 setting means setting a next time-out time in said timer means whenever a time-out interruption occurs in accordance with the order listed in the time-out list;

10 transition mode selection means referring to the return time table when said central processing unit is put in an idle state, and selecting, as a transition mode, a power saving mode having the longest return time from a group of one or a plurality of power saving modes having a return
15 time shorter than a period of time that remains until the subsequent time-out interruption,

20 remaining time setting means setting a period of time that remains after subtracting the return time of the transition mode from the remaining time; and

25 operation mode control means controlling said central processing unit to operate in the transition mode since the start of the idle state until an input of the subsequent time-out interruption, and returning said central processing unit to the normal mode when the time-out interruption is generated.

3. The computer system according to
30 claim 1, wherein said list updating means updates a

time-out list listing, for each job requesting a
time-out interruption, a difference time from the
immediately preceding time-out interruption and a
permitted error time permitted for the occurrence
5 of the time-out interruption from the listed job,

when it is determined, in setting a next
time-out time subsequent to the time-out
interruption, that the difference time is longer
than the permitted error time, said setting means
10 successively examine the listed jobs until an
accumulation of the difference time is longer than
the permitted error time associated with the job,
so as to set an accumulated time immediately
preceding the satisfaction of the above-mentioned
15 criterion, and

said central processing unit
successively executes, at the time-out interruption,
time-out interruption processes from jobs including
the last examined job.

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4. The computer system according to
claim 2, wherein said list updating means updates a
time-out list listing, for each job requesting a
time-out interruption, a difference time from the
25 immediately preceding time-out interruption and a
permitted error time permitted for the occurrence
of the time-out interruption from the listed job,

when it is determined, in setting a next
time-out time subsequent to the time-out
30 interruption, that the difference time is longer

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than the permitted error time, said setting means successively examine the listed jobs until an accumulation of the difference time is longer than the permitted error time associated with the job, 5 so as to set an accumulated time immediately preceding the satisfaction of the above-mentioned criterion, and

said central processing unit successively executes, at the time-out interruption, 10 time-out interruption processes from jobs including the last examined job.

5. The computer system according to claim 1, wherein said list updating means updates the time- 15 out list when there is a time-out interruption request from a new job such that the new job is added to the time-out list at a proper location determined by a time-out interruption request time, and combining time-out interruptions when an error 20 time permitted for the occurrence of the time-out interruption from the new job is longer than a difference in time between the new job and an immediately preceding time-out interruption or a difference in time between the new job and an 25 immediately following time-out interruption, such that the immediately preceding time-out interruption or the immediately following time-out interruption is processed as a time-out interruption from the new job.

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6. The computer system according to claim 2,
wherein said list updating means updates the time-
out list when there is a time-out interruption
request from a new job such that the new job is
5 added to the time-out list at a proper location
determined by a time-out interruption request time,
and combining time-out interruptions when an error
time permitted for the occurrence of the time-out
interruption from the new job is longer than a
10 difference in time between the new job and an
immediately preceding time-out interruption or a
difference in time between the new job and an
immediately following time-out interruption, such
that the immediately preceding time-out
15 interruption or the immediately following time-out
interruption is processed as a time-out
interruption from the new job.

7. A computer readable recording medium
20 storing a program causing a computer to function
as:

table storage control means causing storage
means to store a return time table mapping each of
a plurality of power saving modes of a central
25 processing unit into a respective return time
required for the central processing unit to return
to a normal mode;

list updating means updating a time-out list,
chronologically listing the time-out interruption
30 requests, based on the time-out interruption

requests from the plurality of jobs executed by
said central processing unit;

setting means setting a next time-out time in
said timer means whenever a time-out interruption
5 occurs in accordance with the order listed in the
time-out list;

transition mode selection means referring to
the return time table when said central processing
unit is put in an idle state, and selecting, as a
10 transition mode, a power saving mode having the
longest return time, from a group of one or a
plurality of power saving modes having return times
shorter than the time-out time set designated for
the subsequent time-out interruption; and

15 operation mode control means controlling said
central processing unit to operate in the
transition mode since the start of the idle state
until an input of the subsequent time-out
interruption, and returning said central processing
20 unit to the normal mode when the time-out
interruption is generated.

8. A computer readable recording medium
storing a program causing a computer to function
25 as:

table storage control means causing storage
means to store a return time table mapping each of
a plurality of power saving modes of a central
processing unit into a respective return time
30 required for the central processing unit to return

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to a normal mode;

list updating means updating a time-out list, chronologically listing the time-out interruption requests, based on the time-out interruption

5 requests from the plurality of jobs executed by said central processing unit;

setting means setting a next time-out time in said timer means whenever a time-out interruption occurs in accordance with the order listed in the
10 time-out list;

transition mode selection means referring to the return time table when said central processing unit is put in an idle state, and selecting, as a transition mode, a power saving mode having the
15 longest return time from a group of one or a plurality of power saving modes having a return time shorter than a period of time that remains until the subsequent time-out interruption,

remaining time setting means setting a period
20 of time that remains after subtracting the return time of the transition mode from the remaining time; and

operation mode control means controlling said central processing unit to operate in the
25 transition mode since the start of the idle state until an input of the subsequent time-out interruption, and returning said central processing unit to the normal mode when the time-out interruption is generated.

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